Analysis on the Influencing Factors of Housing Price in China

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Abstract. In order to recognize and analyze the influencing factors of housing price, based on the previous literature, this paper mainly examined 3 major factors: Supply Factors, Demand factors, and Government Policy Intervention in Chinese Housing system. It was indicated that, for supply factors, development investment in the real estate market has a considerable impact on the supply and price of real estate. While for the Demand respect, we further divided it into two factors including population and level of urbanization. The results showed that although total population has no clear relation with the housing price, population aging was a positive relation with the real estate. Also, the level of urbanization only has positive relations with some parts of China. Government policy intervention is unique in China, therefore, the results of this paper could provide some useful information for the investors and governors in analyzing Monetary policy, Housing credit system, Land system, and Taxation system. Generally speaking, our paper generates a better reasoning of Chinese Housing Price.

Keywords: Real Estate; China; Housing price; Supply; Demand; Government Policy.

1. Introduction

Real estate price is also called housing price, generally refers to the average price of housing transaction in a certain area, which is formulated according to the current market situation.The housing price represents a certain area of the real estate market overall price level, to a certain extent which can reflect the price level of the region and residents' income. Due to the escalating cost of housing in several Chinese large cities, it is very arduous to buy a house and rent a house for those people with relatively low income living in big cities. Therefore, the living pressure of residents has increased sharply, which makes people pay more and more attention to various relevant data and information in the real estate industry. In the grim situation, in order to solve the housing problem of residents, the data analysis of real estate is particularly important. Through reading a large number of literature, this paper studies and summarizes the influencing factors of real estate prices, mainly from the following three perspectives: supply perspective, demand perspective and government policy intervention.

At present, related research on the impact of housing prices has attracted attention from all parties. For example, Li et al. [1] use the utility function based on consumption constraints to construct a "Population quantity -- monetary policy -- real estate price" theoretical model, and use the link between supply and demand to analyze how the urban population and monetary policy impact the price of real estate. Liu et al. [2] deeply studied the dynamic correlation mechanism among real estate price, economic growth and the regulatory effectiveness of monetary policy on the real estate industry through the Markov district system transfer model. Through the summary and induction of domestic and foreign literature, the influencing factors can be summarized from the supply and demand level, economic level, political level and other aspects.

The structure of this paper's reminder is as follows: Section 2.1 analyzes the main factors affecting real estate prices from the perspective of supply; Section 2.2 summarizes the main factors affecting property prices from the perspective of demand; Section 2.3 the research summarizes the key factors affecting property prices from the perspective of government policy intervention.

2. Literature Review

2.1 Supply Factors

2.1.1 Investmentin real estate

Investment in real estate determines its market'sgrowth and prosperity, represents the market's overall scale, and also reflects the potential availability of the real estate industry.

Tang et al. [3] adopted Guangxi's data during the period between 1995 and 2010 to conduct empirical analysis of the link among GDP, real estate's investment, and its prices. The research result indicated that there was an equilibrium relationship overthelongrunand a short-term dynamic coordination relationship among the investment volumeinreal estate, real estate price volatility and rateofeconomic growth in Guangxi.

Focused on 35 large and medium-sized Chinesecities, Li and Wu [4] applied the relevant data duringtheperiodbetween 2002 and 2012 to conduct a research on the interaction between real estate prices and its investment condition. Basedonthis, they tested the interaction empirically through panel data fixed effects. The result demonstrated that the coefficient of one and two-period lagging investment inrealestateto itspricewas negative, indicating the increase in real estate investment mighthave a depressive influence on the housing price.

However, when investment increases, the real estate price does not necessarily appear to have a downward trend, because the real estate market has its special characteristics [5]. To be precise, despite the case that real estate price generally fall, if the increasing investment is used to improve the standardandquality of commercial housing instead of something else, the real estate price will rise [5].

Overall, the availability and price of real estate was considerably influenced by real estate investment.

2.1.2 Landsupplyandlandprices

The cost of production theory holds that the value of goods consists of all kinds of production costs. For developers, the real estate price includes the development costs plus a certain amount of profit [6]. As a significant part of real estate development costs, the increase in land price drives up the selling price of real estate [7].

Similarly, Ping and Chen [8] argued that the basic factors determining property prices include land purchase prices and credit injection. However, the marginal effects of the two dimensions are different, land prices had more marginal effects on house prices, and credit injection had minor marginal effects on house prices. And house prices would gradually rise because of the increase in land prices.

In addition, Wang [9] used the survey data of 536 properties in 87 cities in 30 provinces, which was officially announced by the Ministry of Land and Resources on July 25, 2009, to research the independent role of land prices with regard to house prices in China. This research indicated that every 1 percent increase in land prices led to 0.355 percent increase in house prices. At the same time, this kind of price elasticity also had fairly noticeable regional differences, not only reflected in the inter-regional differences between the east and the middle and west regions but also in the inter-regional differences between large cities and small and middle-sized cities in each region.

2.2 Demand Factors

2.2.1 Population structure and family structure

Population structure determines the number of houses demanded. It is reasonable to expect that if the population in one particular city grows and all other condition remains the same, the speed of rising in house price will accelerate.

In their research, Li and Liang [10] tested this hypothesis. Focused on 35 cities in Northeast China, Li and Liang [10] tried to find the relation between city total population and house prices between 1999 and 2018[10]. Those cities are facing an intensive population shrinkage because of the shrinkage of industry. To analyze whether population fluctuation and house prices are correlated, Li and Liang [10] use York and McGee's modeling approach. In their research, Li and Liang [10] divided the period they analyzed into two parts: one starts from 1999 to 2008, and the other from 2009 to 2018. In the first period, three fourth of the cities in that area experienced population growth of around 12 percent, and in the next period, nearly all cities experienced population decline. However, the price of a house in all of those cities increased even with the loss of population in the second period. The house prices of those 35 cities experienced 56 percent of average growth rate during 1999 and 2008, which is higher than 43 percent from 2008 to 2019. Still, Li and Liang [10] claimed that the relation between house prices and population fluctuation are asymmetric, which means there is no clear relation, both in directions and magnitudes. Instead, they claimed that factors such as rising land costs, private or public real estate investment, GDP per capita, and the number of households could be to blame for rising home prices.

Although the city's total population has no significant relation to house prices, it is still possible for other properties of a population, such as the population aging in China, may also make a difference in the demand.

In their paper, Wang et al. [11] mainly discussed the influence population aging has on real estate prices in their articles. Wang et al. [11] used this Empirical Model Equation to make the prediction:

$$\mathrm{LnHP_i} = \alpha + \beta_1 \mathrm{AgeStructure_i} + \beta_2 \mathrm{PopMobility_i} + \gamma \mathrm{X_{ij}} \quad (1)$$

In this above equation, Wang et al. [11] got the value of $\mathrm{AgeStructure_i}$based on children and elderly dependency ratio respectively. As for$\mathrm{PopMobility_i}$, that means the mobility of the population in city i, which is calculated by population migration between different regions and population that does not involve in agricultural jobs at city i.$\mathrm{X_{ij}}$ means other control variables at city i.

Wang et al. [11] found out that 1% increase in the elderly population raise 0.308 percent of the housing prices. Furthermore, as the background knowledge, Yang and Meng [12] said that China was an aging society in 1999. By 2019, those who are at least 60 years old takes up to 18.1 of whole population in China and who are at least 65 years old has a proportion of 12.6 percent. Additionally, Wang et al. [11] revealed that the proportion of the elderly population who is older than 65 has continued to grow. In 2025, there will be more than 300 million elderly individuals, or approximately 20% of the population. Thus, as the population aging develops as mentioned before, housing price, as long as other conditions hold true, will increase.

In a word, although Li and Liang [10] were unclear about relation between total population and Chinese housing price, Wang et al. [11] stated that population aging did have a positive relation with housing price.

2.2.2 Level of urbanization

The next key factor from the demand side of housing is the level of urbanization.

According to Wang et al. [11], from 33.35% in 1998 to 56.1% to 2015, urbanization level in China is gradually increasing, which, in turns, increase the demand of urban housing. Based on the previous data model mentioned in 2.2.1, Wang et al. [11] concluded that urbanization rate have impacts on urban housing prices: a boost of 1% in urbanization can rise the housing prices by 0.408%.

In the meantime, Liu et al. [13] also researched the effect of urbanization. Unlike Wang et al. [11], who analyzed the urbanization level in the whole country, Liu et al. [13] grouped 29 Chinese provinces she researched into four according to geological regions: the eastern, middle, western, and northeastern regions to better investigate. For research, Liu et al. [13] mainly focused on time period between 1990 and 2014. To test the impact urbanization, have on real estate investment for those provinces, Liu et al. [13] employ Granger causality to examine the result. She discovered that, in China, interactions that occur between urbanization and real estate investment vary across different regions: while there is a causal relationship is evident between urbanization and housing price in the center and northeast, this kind of relation fails to be proved in east and west part.

All in all, Wang et al. [11] claims that urbanization level has positive impacts on urban housing prices, while Liu et al. [13] refutes the work of Wang et al. [11] by stating that this rule only works for some parts of China.

2.3 GovernmentPolicyIntervention

2.3.1 Monetarypolicy

Using monetary policy to control deposits and interest, the Chinese government can have a huge influence the housing price. Income reflects the amount of money in circulation in the market, and the interest rate directly affects the government's expected judgment of the money supply in the market, so the money supply will also, directly or indirectly, affect the real estate prices [5]. Matteo [14] investigated how macroeconomic factors influence house prices based on the self-regressive VAR vector model,a model that demonstrates that monetary policy promotes higher property prices. At the same time, the results of empirical research also show that quantitative monetary policy and monetary price policy can have a major influence on theprice of real estate[15-16].

Maroc, Christopher [17], based on Bayesian research, found that regional and monetary factors can have an impact on house prices, but the bank loan interest rates have less impact. Demary [18] studies the influencing factors of real estate prices based on the SVAR model, which empirically shows that real estate prices will be affected by monetary impact and output, and will also have a great impact on the national economy.

Nowadays, with boom of the economy and the increasingly ofpersonal disposal, the housing market is in a state of low leverage. If consumer deposits increase accordingly, they will consider investing in housing. However, consumers’ improving purchaseability of the will lead to the rising trend of housing price. Loose credit and huge profits will boost the expansion of money volume, forming a new round of demand stimulus, real estate prices show a spiral upward trend [5]. When the money supply drops, the loan amount of real estate developers reduces, and the cost increases, which limits the abnormal increase in property prices. At this time, the real estate price gradually tends to be normal.

2.3.2 Housing credit system

Financial credit is inseparable from real estate prices, and housing market is extremely sensitive to interest rates variability [5].

Existing documentation has shown that the impact of credit constraints on home prices is significant. Kiyotaki and Moore believes that the rising prices of housing, the most reliable collateral, raise the ceiling of home loans. When families began to increase the proportion of investment into housing, it elevate housing prices, which further eased their credit constraints, thus forming a strong "financial accelerator" mechanism between credit constraints and housing prices. In the latest study, Liu et al. [19] explored the impact of changes in credit constraints on the price-to-price rent ratio by introducing a heterogeneous agent model. The heterogeneity of this model comes from the housing demand of different agents. Some of the agents with the high marginal utility of housing face credit constraints, which endogenous generates the liquidity premium of housing. At this time, the relaxation of credit constraints will lead faster increase in housing price than housing rent [20].

The study of tracing the impact of credit on housing prices goes back to Hayek's [21]monetary cycle theory, which reveals that excessive credit expansion creates asset price bubbles. Collyns [22] used vector autoregressive to analyze property markets in East Asian countries and found that increased credit raised house prices. Goodhart et al.[23] pointed out that the Fed's excessive credit supply after the "subprime mortgage" crisis prompted a rebound in housing prices, causing simultaneous changes in housing prices and credit. Davis [24] has built a general equilibrium model of credit and house prices, arguing that banks' loans to home buyers will drive up house prices through the demand side. The research of [8, 25-26] such as Ping Xinqiao also provided domestic evidence for this. These documents earlier found that the loans invested in real estate enterprises and home buyers had a significant positive effect on housing prices, forming a view of "excessive financial support". In the follow-up research, Chen [27] used the DSGE model, which includes the housing market, to point out that banks' willingness to lend more drives the housing prices through the direct, substitution, risk-bearing, and financial accelerator effect. Ma [28] used threshold panel regression to analyze the data of Chinese provinces, and found that bank credit has nonlinear and asymmetric effects on real estates, especially when the scale of housing loans and bank credit on housing prices are high.

2.3.3 Land system

Edward and Joseph[29], based on the multiple linear regression model, selected land transaction price and regional economic production value, and other indicators to analyze the influence degree of housing price. According to the findings, there is no connection between land transaction costs and home prices. Wang [30]studied the macroeconomic influences of the national housing price in terms of the vector autoregression model, and analyzes in-depth the impact time lag, the impact degree, and the continuous impact time. The results show that the land transaction price is a major factor on real estate. Hu and Feng [31], based on the multiple regression model on the real estate price in Zhejiang Province Research, show that the land turnover will affect housing prices.

Chinese real estate market is growing quickly, withexpansion of land market and the real estate market, where the housing market fluctuates strongly for many times. The urban land system is at the heart of the housing system, which has an important influence on the functioning of the housing market [32].

2.3.4 Taxation system

Tax revenues can have a direct impact on the both the supply and demand side of real estate, and then indirectly affect its price. Thus the tax is a key role in the process of macroeconomic monitoring of the housing market. [33].

The orderly operation of society is the legal guarantee, and fiscal tax is important in fostering the growth of the real estate sector. Fiscal tax can effectively standardize and regulate the real estate market, making the real estate market to be more stable [34].

The property tax will lower the residential assets' long-term equilibrium price, and the short-term effect is to increase the rent and reduce the balanced housing supply. Whether the tax is reasonable depends on the government's value judgment and its contribution to realizing the government's intention. Residential transfer income tax reduces residential assets price and suppresses housing market speculation [35].

3. Conclusion

Since the Reform and Opening-up, with the increasingly rapid improvement of China's economy, the pace of urbanization has accelerated and people's living standard has improved significantly. Under the comprehensive influence of a variety of factors, the real estate price in most cities presents an upward trend. In this paper, we present a systematic overview of the three main factors on real estate prices: supply factors, demand factors, and government policy intervention. Interms of supply factors, the rising in real estate investment has a depressive influence on real estate prices generally. And as a significant part of real estate development costs, the increase in land price drives up the selling price of real estate. With regard to demand factors, while population increase or decrease has no significant relation to real estate prices, other population issues such as the population aging in China may make a difference in the demand side. Urbanization level alsohas favorable influence on urban housing prices in most Chinese cities. In general, Chinese real estate prices are mainly influenced by the demand side. In the meantime, due to the unique nature of China's economic system, the trend of real estate prices in China depends heavily on government policy intervention. So, this paper makes a detailed analysis of how various relevant policies affect the fluctuation of real estate prices from four respects: monetary policy, housing credit system, land system and taxation system. Moreover, consider ingit from a practical standpoint, the real estate industry has widely influenced many other industries of the national economy. Therefore, a correct analysis of the influencing factors of Chinese real estate prices is of greatly correlated to the health of real estate industry development, economic development, and social stability. The property issue in China is both an economic problem and a livelihood issue. In the future, based on the rich research results at home and abroad, we should further consider the heterogeneity of the factors influencing house prices in different periods and different regions, and conduct profound studies on the real estate market in light of Chinese actual situation. In addition, in an effort to prevent the occurrence of real estate bubbles, the government department is supposed to pay more attention to the development trend of the housing industry, reasonably control housing prices, and robust the real estate regulation system.

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